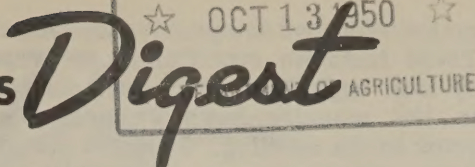


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QUARTERLY

TECHNICAL STANDARDS

VOL. II NO. 1 *REA* U.S.D.A. WASHINGTON 25, D.C. SEPTEMBER 1950INCREASED EMPHASIS ON
OPERATIONS AND MAINTENANCE

The fundamental importance of the operations of rural electric distribution systems and the maintenance of the component parts of these systems has been coming to the fore. Our Division has been working closely with the Technical Operations and Maintenance Section, Engineering Division, by furnishing basic material and reports which are being distributed by it. We outline, in the next several paragraphs, a number of typical projects in the categories of operations and maintenance, some recently completed and others now underway.

Maintenance of Watthour Meters: A booklet, in preliminary draft form, has been prepared on the above subject as a supplement to the information now available on the servicing of single-phase watthour meters. Draft copies have been sent to engineers in REA, manufacturers and watthour meter servicing organizations for comment.

Recloser Maintenance: An oil circuit recloser maintenance bulletin has been prepared for the purpose of giving REA borrowers correct OCR maintenance procedures.

Chemical Brush Control: A progress report on brush control by chemical means has been prepared. It presents additional information obtained since the distribution of the interim report last year.

Corrosion: A status report on anchor rod corrosion which summarizes the available information on this problem was issued in July 1950. Further study

is being carried on to prevent undue corrosion of underground hardware.

Materials And Equipment Performance--Methodology: The method for evaluating the performance of materials and equipment has been formulated. Two hundred fifty REA borrowers comprise the sample. This procedure provides a valuable tool for obtaining and evaluating basic information concerning problems of operational maintenance. This comprehensive project will supply factual information which will reflect immediate operations and maintenance problems and their scope. REA borrowers have indicated their willingness to assist in every way possible.

Radio Interference Manual: Proper operation and maintenance will assist in the reduction of rural power line radio interference. Tests have been and are being conducted with the aim of specifying more stringent limitations regarding radio noise produced by the electrical apparatus. A report will be issued shortly.

Voltage Regulators: A guide for the application of voltage regulators to rural power systems is being prepared.

OUR PHASE OF
RURAL TELEPHONE PROGRAMHighlights of Progress In Standardization
And Investigational Activities:

1. Meeting With Central Office Equipment Manufacturers' Representatives: Proposed REA specifications for dial equipment for central offices, 100 to 800 lines ultimate capacity, were discussed thoroughly at a two-day meeting in Washington, D. C. with representatives of five

major telephone equipment manufacturers. These tentative specifications, prepared by our engineers, had been distributed to the manufacturers' representatives prior to the meeting. Standard specifications satisfactory to all resulted from the conference. The revised specifications have been distributed for final review.

2. Drop Wire, Lead Cable, Telephone Set and Manual Central Office Equipment Specifications: Substantial progress has been made on the drafts in the regular process of distribution, follow-up and resolution of comments.

3. Pole Line Equipment: A tentative list of miscellaneous pole line articles has been sent to manufacturers for comment.

4. Radiotelephone: A meeting was held with engineering representatives of a well-known equipment manufacturer to discuss the use of radio in the rural telephone program. Information gained at the conference will assist us in obtaining experimental equipment.

5. Carrier Telephone: We are in the process of obtaining experimental carrier equipment for trial installations.

6. Steel Brackets: Arrangements have been made with a manufacturer to have a substantial number of steel brackets installed on a number of REA borrowers' systems to obtain operating experience on them. The steel brackets replace wooden brackets normally used on single circuit lines.

SOME ELECTRO-AGRICULTURE HIGHLIGHTS

Use of Electricity in Crop Conditioning: A report containing abstracts from literature on crop processing by electrical means has been prepared and distributed.

Electric Home Pasteurizers: A report entitled "Electric Home Pasteurizers For Milk And Cream" has been prepared which includes descriptions of three types of electric pasteurizers. Copies are available upon request.

NATIONAL ELECTRICAL SAFETY CODE AND NATIONAL ELECTRICAL CODE

In the previous two issues of the Digest we discussed the dynamic nature and advantages of the standardization process. Now, in tabular form to facilitate comparison, we analyze the above codes which are national standards and of great importance to REA borrowers.

Subject	National Electrical Safety Code	National Electrical Code
History	1. Originally drawn in 1914. 2. American Standards Ass'n. Standard in 1923.	1. Originally drawn in 1897. 2. American Standards Ass'n. Standard in 1925.
Sponsor	National Bureau of Standards	National Fire Protection Ass'n.
Purpose and Scope	Safety to employees and the public around electrical equipment used in <u>overhead and under-ground</u> construction.	Practical safeguarding of persons and of buildings and their contents from electrical hazards arising from the <u>utilization</u> of electricity.
Mechanism for Enforcement	Public Service Commissions, Industrial Commissions and Laws.	Public Service Commissions, Industrial Commissions and Laws.
Mechanism for Interpretation	N.E.S.C. Committee on Interpretations	N.E.C. Committee of National Fire Protection Association.
Application With Respect to REA Borrowers	Deals with the generation, transmission, and distribution of electric power to the consumers' premises.	Deals with the receiving of electric power on the consumers' premises and its use.

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TECHNICAL STANDARDS

Digest

VOL. II NO. 2

REA

U.S.D.A.

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COORDINATION--INDUCTIVE, THAT IS!

Noise in telephone receivers, and other adverse effects, may result from parallel exposure of telephone lines to power lines, as a consequence of electromagnetic induction. To avoid or reduce these difficulties, measures may be taken in either or both - usually both - of the two kinds of public service plant involved. Inductive coordination is the art of effecting the necessary mitigation through cooperative study of these problems by engineers of both fields. The object is always to attain the best engineering solution--satisfactory from the standpoint of the telephone service, an economical solution, and a solution which imposes the least possible restraints upon customary methods of operation and maintenance, in both plants. This is the significance of the word "coordination." Considerable work has been done, and notable advances in the art have been made by REA engineers in the effectuation of the rural electrification program. In our studies we have made wave shape measurements to determine the harmonic content of the lines. Remedial measures such as the application of shunts or terminations to the power lines have been devised and applied. Since the advent of the telephone program REA has become directly interested in both sides of the inductive coordination problem.

SEVERAL HIGHLIGHTS OF OUR PHASE OF THE RURAL TELEPHONE PROGRAM

Construction Drawings and Specifications: Plans and specifications for the construction of telephone systems have been completed and made a part of the Telephone

System Construction Contract (Labor and Materials), Form DS-T-10. In addition to the written part of the specifications, 106 construction drawings are included.

Suggested List Of Materials Suitable For Use On REA Borrowers' Telephone Systems: A tentative list, for interim purposes only, has been compiled and distributed.

Transmission: The engineers are now delving into the transmission characteristics of subscribers' telephone sets. The characteristics over certain types of circuits are being ascertained. Standards are being established for exchange and toll plant of telephone systems of REA borrowers and practices are being prepared covering the application of the standards.

Subscriber Radiotelephone: A project is underway to ascertain the applicability, usefulness and reliability of existing types of radiotelephone apparatus to rural telephone systems. An experimental installation of such equipment is planned for use in remotely located areas. A radio link would be used to take the place of wires for point-to-point communication. A number of problems are connected with this type of equipment and new developments are required to make it more useful.

REPRESENTATIVE PROJECTS COMPLETED AND UNDERWAY

Pin Insulators: Lightning punctures of pin type insulators have occurred in a number of areas. A status report on pin insulator failures has been issued. We

urge members of the REA field staff to keep up the good work of keeping us informed, through the medium of their field reports, of failures of this nature or any other nature.

Shunt Capacitor Application Manual: Shunt capacitors are used to obtain a higher power factor for the system and release substation and line capacity. Reduction in wholesale power costs and reduced line losses are some of the benefits of proper application. This project is scheduled for completion in the near future. A manual covering the application of shunt capacitors is being prepared and will be distributed.

Chemical Brush Control: The continuing problem of the maintenance of brush-free rights-of-way on rural power systems is still receiving attention. When additional information has been acquired, further reports, to supplement the interim and progress reports previously distributed, will be issued. The photo below illustrates the effectiveness of the 2,4-D chemical on brush growth.

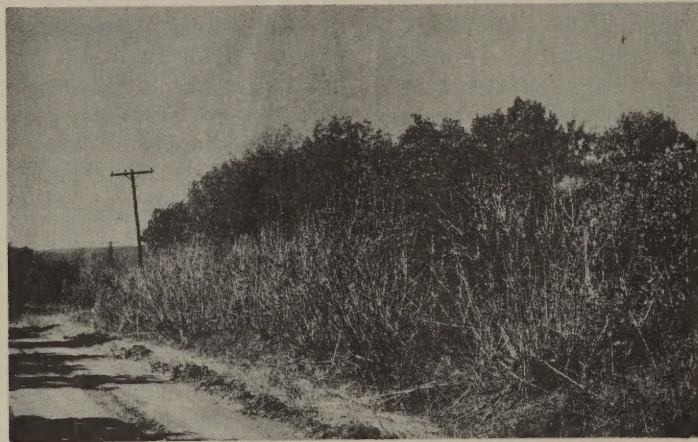
Radio Interference: A manual on the location of radio interference on rural power systems has been prepared and is awaiting distribution.

Substation Transformer Standards: Standards for this type of transformer have been established. Manufacturers are now submitting equipment to conform to these specifications.

Electric Ranges and Automatic Washing Machines: Revised sets of manufacturers' specifications have been prepared and printed for household electric ranges and automatic clothes washing machines.

New Pole Specifications

A new set of revised specifications for the treatment and inspection of treated timber purchased by REA borrowers has been reviewed by REA personnel, the pole-treating industry and the Forest Products Laboratory, Forest Service. Comments have been received from these groups and the second draft of the specifications is being prepared in final form for submission to the Technical Standards Committees for action. On a consulting basis, the Laboratory is determining the service life of rural electrification poles of various species and treatments in different areas of the United States as a basis for computing comparative annual costs.



Box elder killed by one application of 2, 4-D foliage spray. Tall growth in background is off the right-of-way and was not sprayed.

